

**Homework 2****Due date:** Friday, 1/23/08**Weight:** 5 points.**Name:****Grade:**

(Reminder: You should finish memorizing the “symbol table” for Friday’s quiz!)

It’s time to begin your reading. By Friday, please read pages 1-7 in the text (*Write Your Own Proofs*, by Babich and Person). You may enjoy the four Forwards to the text, but you won’t be tested on them. Do read carefully – I will lecture under the assumption that you have done the reading!

The simplest kind of proof is the *chain of equalities* proof, and your practice in previous courses has already developed this proof skill.

**Example 1.** Prove that  $2x + (x + 1)(x - 5) + 6 = (x - 1)(x - 1)$ .

Proof by **Simultaneous Reduction:** (stylistically inferior) I feel that this proof style is technically correct, but confusing and indirect. Other professors feel that it is not even technically correct. In any case, it should be avoided:

$$\begin{aligned} 2x + (x + 1)(x - 5) + 6 &= (x - 1)(x - 1) \\ 2x + (x^2 - 4x - 5) + 6 &= x^2 - 2x + 1 \\ (x^2 - 2x - 5) + 6 &= x^2 - 2x + 1 \\ x^2 - 2x + 1 &= x^2 - 2x + 1 \checkmark \end{aligned}$$

Proof by **Chain of Equalities:** (stylistically proper) This proof is cleaner, clearer, and logically more straightforward. Notice that it begins with the left hand side, and ends with the right hand side.

$$\begin{aligned} &2x + (x + 1)(x - 5) + 6 \\ &= 2x + (x^2 - 4x - 5) + 6 \\ &= (x^2 - 2x - 5) + 6 \\ &= x^2 - 2x + 1 \\ &= (x - 1)(x - 1) \end{aligned}$$

Now for the homework: Suppose  $f(x) = 1 - x$ . Prove, using the superior “chain of equalities” method, that  $f(f(n + 2) + 2) = n$ . There should be room on this page.